

EXHIBIT H

OCT 18 1985

Inspection Report - Northern States Power - Riverside Generating Station
Minneapolis, Minnesota

David Schulz, Environmental Engineer
Air Compliance Branch, Section I

Files

Inspection Date:

September 4, 1985

Personnel Participating:

David Schulz, U.S. EPA
Steve Kurkowski, MSP, Production Engineer
Ross Hammond - MSP, Acting Superintendent

Plant Description:

Northern State Power Company's Riverside Generating Station is comprised of 3 coal-fired boilers. Boilers 6 & 7 are tied into an integrated system with 3 turbines, with a combined generating capacity of 110 MW. Boilers 6 & 7 are equipped with a combined Joy-Noiro dry scrubbing control system. This control system consists of a single rotary atomizer absorber chamber followed by a 12 compartment baghouse. Flue gas from the boilers enters the absorber chamber in a cyclonic fashion, where it reacts with the slaked lime scrubbing slurry which is atomized by a single rotary atomizer. The spray dryer absorber operates about 25°-35°F above the adiabatic saturation temperature (145°-160°F), at a pressure drop of about 11". The system operates with about 80% recycled slurry from the absorber. A grinder has been installed at the bottom of the absorber chamber to grind any large deposits of material which fall off the absorber walls. The baghouse is of reverse-air design, with 250 teflon coated fiberglass bags per compartment, and operates at a pressure drop of 3"-6". Boilers 6 & 7 are vented through separate 220' stacks equipped with Lear-Siegler RM-41 opacity monitors, and a combined Lear-Siegler SM 810 SO₂ monitor.

Unit 8 is a 223 MW Babcock & Wilcox cyclone coal-fired unit (5-10' diameter cyclones), with a rated capacity of 1,600,000 lb. steam/hr. Unit 8 is equipped with 2 electrostatic precipitators operating in series. A Research Cottrell ESP built in 1963, with 6 sections and a design SCA of 117 ft²/1000acfm, is followed by a Buell ESP built in 1970, with 6 sections and a design SCA of 223 ft²/1000 acfm. Unit 8 is vented through a 485' stack equipped with a Lear-Siegler RM-41 opacity monitor and a Lear-Siegler SM 810 SO₂ monitor

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The Riverside Station receives coal by rail from the Westmoreland and Colstrip mines in Montana. The coal is blended with petroleum coke (10% blend), which is delivered by truck into the station. The coal dumper house and transfer points are evacuated to baghouse control systems. A water wagon is used for wetting of the coal piles as needed. Sides of the coal piles are sealed with a surfactant.

Following is a summary of station design data:

Boiler	Type	Lb. Steam/Hr.	MW	Control Equipment	CEM	Stack Height
6	B&W P-C	570,000	110 (combined)	Joy-NIRO Spray dryer/baghouse (combined)	L-S RM41	220'
7	B&W P-C	570,000			SM 810 (combined) L-S-RM41	220'
8	B&W cyclone	1,600,000	223	R-C ESP, Buell ESP	L-S RM 41 SM 810	485'

Findings:

During the time of inspection only unit 8 was operating at 225 MW (load was increased gradually over past several hours). A review of CEM data showed unit 8 opacity between 12-20% with brief spikes up to 70% (only instantaneous opacity values recorded). A review of the opacity strip chart showed a gradual rise in opacity throughout the day from 2-3% in the early morning. The SO₂ monitor showed SO₂ concentrations between 1,050 -1,150 ppm.

A review of unit 8 ESP operating parameters showed the following:

Section	Primary Voltage (volts)	Primary Current (amps)	Secondary Voltage (KV)	Secondary Current (ma)
<u>Research Cottrell ESP</u>				
81 inlet	100	20	0	80
81 center	100	105	0	520
81 outlet	300	90	0	400
82 inlet	300	70	0	280
82 center	260	80	0	380
82 outlet	250	95	0	460
<u>Buell ESP</u>				
A	200	20	0	120
B	230	20	0	170
C	Out of Service (since 6/25/35)			
D	250	60	0	300
E	120	30	0	60
F	160	25	0	100

In response to concerns expressed about high opacity on unit 8 plant personnel immediately took steps to reduce unit load (to 195 MW) and to check operation of the ESP's. They determined that the Buell ESP had been taken off automatic voltage control during some maintenance checks the previous day and never returned. They felt that this was the cause of the higher opacity readings. A later check of the COM recorder showed that opacity had dropped to 6-7%, with brief spikes up to 20%.

Plant personnel indicated that boilers 6 & 7 would be out of service for an extended outage (till April 1987), for major work aimed at upgrading and extending the operating life of these boilers. This project, estimated to cost \$50 million, includes boiler modifications, new air heater installation, and installation of a new turbine with higher generating capacity (130-150 MW). Some minor work to the pollution control system is also planned, including coating of the baghouse internals where corrosion has been a problem.

A review of coal sampling and analysis (CSA) data for July 1985 on unit 8 showed individual analyses ranging from 1.89 - 2.93 lb. SO₂/MMBTU (See attached).

bcc: Czerniak/Kertcher/Kee
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P. J. Idm

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